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核动力堆热功率跟踪系统的多步模型算法控制仿真研究

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摘要 动力堆控制系统是一带不确定参数及干扰的复杂非线性系统,采用常规的古典控制很难保证其热功率精确跟踪负荷的变化。本工作利用系统开环脉冲响应序列建立了一非参数模型,并应用多步模型算法控制原理提出了一种动力堆热功率跟踪数字控制方法。该方法跟踪调节性能好、鲁棒性强、能消除不可测干扰。通过仿真检验和调试证明了该方法的正确性和有效性,并实现了热功率 负荷的高精度匹配。

关键词 [核反应堆](#) [多步模型算法控制](#) [系统仿真](#)

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Simulation Study of Multi-step-Model Algorithmic Control of the Nuclear Reactor Thermal Power Tracking System

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Abstract The classical control method is usually hard to ensure the thermal power tracking accuracy, because the nuclear reactor system is a complex nonlinear system with uncertain parameters and disturbances. In the paper, a sort of non parameter model is constructed with the open loop impulse response of the system. Furthermore, a sort of thermal power tracking digital control law is presented using the multi step model algorithmic control principle. The control method presented in the paper has good tracking performance and robustness. It can work despite the existence of unmeasurable disturbances. The simulation experiment testifies the correctness and effectiveness of the method. The high accuracy matching between the thermal power and the referenced load is achieved.

Key words [nuclear reactor](#) [multi step model algorithmic control](#) [system simulation](#)

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